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Odgovorni urednik / *Responsible Editor*
dr. Darko Friš
Zgodovinsko društvo dr. Franca Kovačiča
Koroška cesta 53c, SI–2000 Maribor, Slovenija
e-pošta / *e-mail:* shs.urednistvo@gmail.com

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Studia Historica Slovenica

Kazalo / *Contents*

Članki in razprave / *Papers and Essays*

Studia Historica Slovenica

S *tudia*
H *istorica*
S *lovenica*

Studia historica Slovenica

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Some Phonotactic Statements about the Slovene Pronunciation of English Consonant Clusters from the Perspective of MDH and Optimality Theory

Klementina P. Jurančič
Ph.D., Assistant Professor
University of Maribor, Faculty of Arts, Department of English and American Studies
Koroška cesta 160, SI–2000 Maribor, Slovenia
e-mail: klementina.jurancic@um.si

Bernhard Kettemann
Ph.D., Full Professor
University of Graz, Institute for English Studies
Heinrichstrasse 36, A–8010 Graz, Austria
e-mail: bernhard.kettemann@unigraz.at

Abstract:
The present paper discusses English consonant clusters pronounced by Slovene speakers by considering two approaches. One is the Markedness Differential Hypothesis (MDH) tested on English speakers by Eckman (1977). Based on typological universals such as the implicational relationship it maintains e. g. that if a language has a word intitial two-member onset or syllable/word-final two-member coda consisting of two stops (or two fricatives) this implies that it also has one consisting of a stop (plosive) and fricative. The second approach used in this presentation is Optimality Theory (Prince and Smolensky, 1993). Making use of the inherent conflict that constraints and their violations impose on the candidate set of produced consonant clusters and their features it is possible through the resolution of this conflict to arrive at the optimal candidate of a particular grammar.

Key words:
consonant clusters, English, Markedness Differential Hypothesis (MDH), Optimality Theory (OT)

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0. Introduction

The research on the pronunciation of English in Slovenia in which the two approaches (Markedness Differential Hypothesis – MDH and Optimality Theory – OT) are discussed, was conducted on the primary school and secondary school Slovene population with a non-experimental causal pseudo-longitudinal descriptive method accompanied by a statistical analysis. For informant selection in data collection, the Artificial Neuron Network (ANN) system[1] was employed. We established that the ANN procedure was the only way to ensure the coverage of the whole Slovene territory and the seven large dialect groups. The theoretical framework for the analysis was an initial (strong) contrastive analysis (CA) study with which we wished to determine the possible and potential differences between the sound systems of individual Slovene dialects and the sound system of the target foreign language, namely English. With respect to the latter, the British variety was chosen because this was the variety taught in schools. The American variety of English, however, due to limitless exposure, could not be ignored, which is why it was necessary in the analysis to employ strategies separating results which could be attributed to the influence of this target variety from results of L1 dialect interference. Strong CA, which only predicted potential difficulties or interferences in the learning or acquisition of English as an L2/FL, could not provide proof for the existence of such interference, which is why weak CA was employed which involves comparing the L1 and the L2 systems, identifying potential difficulties and on the basis of error analysis (EA), namely analysis both of errors and non-errors, to identify the features in the pronunciation of informants which could be attributed to L1 dialect interference. The first part of the research was completely based on gathering and analysis of material, presenting the results in tables and discussing the conlusions, namely the inductive approach to research. The second part of the research was planned to gain fieldwork material in order to use it in the framework of linguistic theories. Slovene learners of English across the whole of Slovenia (chosen by means of the ANN system) where for this reason given tasks involving chosen English samples focusing particularly on final consonant clusters were administered to the 289 respondents. The materials were dealt with in the framework of the MDH and Optimality Theory, providing the research of pronunciation of English in Slovenia with an overall deductive

[1] For a more detailed description see Klementina P. Jurančič, "Artificial neuron network (ANN) techniques in investigating L1 dialect interference in the pronunciation of English in Slovenia", *Studia Historica Slovenica* 17, No. 1 (2017), pp. 399–419 (hereinafter: Jurančič, "Artificial neuron network (ANN) techniques in investigating L1 dialect interference in the pronunciation of English in Slovenia").

note. The results of employing both theoretical frameworks (MDH and OT) are presented in this paper.

1. Markedness Differential Hypothesis

One of the typological universals is that involving at least two structures in an implicational relationship: if x then y. This means, for example, that if a language has a word initial two-member onset or syllable/word-final two-member coda consisting of two stops (or two fricatives) this implies that it also has one consisting of a stop (plosive) and fricative. No language has only the stop-stop combination. This and similar problems have been dealt with by the Markedness Differential Hypothesis (MDH).[2]

Other studies relating to markedness are based on the *sonority distance* criterion influenced by universal syllable structure conditions. These maintain that the universal characteristic of "intrinsic" syllable structure (e.g. CVC) is the symmetry of the initial and final segments with regard to their degree of sonority. Each syllable has a peak, usually a vowel. If additional segments are present at the beginning and the end of the syllable, they have a tendency for sonority to decline from the peak to the peripheral parts of the syllable.[3] Closest to the peak are glides, then come the sonorants (first liquids, then nasals) and then the obstruents (first fricatives, then plosives).

plosive ← fricative ← nasal ← liquid ← glide ← vowel → glide → liquid → nasal → fricative → plosive

This is the so-called Universal Canonical Syllable Structure (UCSS). There are, however, languages with language-specific syllable structures that violate the UCSS (e.g. *st* and *str* in English, German and Slovene onsets,...). Such clusters would thus qualify to be marked as opposed to the unmarked "rule-abiding" clusters.

In *one-member groups* of codas (e.g. in English), final voiceless realisations

[2] Fred Eckman, "Markedness and the Contrastive Analysis Hypothesis", *Language Learning* 27 (1977), pp. 315–330. For the pronunciation of German as a foreign language in Slovenia, see Teodor Petrič, "Acquisition of Marked
Consonant Clusters in German as a Foreign Language", *Poznan Studies in Contemporary Linguistics* 37 (2001), pp. 157–186.

[3] Joan Hooper, *An Introduction to Natural Generative Phonology* (New York, 1976); Paul Kiparsky, "Metrical Structure Assignment is Cyclic", *Liguistic Inquiry* 10 (1979), pp. 421–441; Elisabeth Selkirk, "On the Major Class Features of Syllable Theory", in: *Language Sound Structure*, ed. M. Arnoff and R. Oehrle (Cambridge, 1984), pp.107–136.

of voiced consonants would qualify as *marked* compared with the *unmarked* voiced ones.

In *two-member groups* of coda, the fricative-plosive codas would classify as *unmarked*, plosive-plosive and fricative-fricative combinations as more marked and plosive-fricative codas as less marked than the latter. The succession from unmarked to marked codas would thus be: *fricative-plosive –plosive-fricative –plosive-plosive –fricative-fricative*.

A *three-member group*, especially if it is an onset, is considered *marked* in comparison with two-member groups, as the only three-member onset in English is a two-member group preceded by s-. Three-member codas are quite common in English and in Slovene. In English they usually consist of an extra-syllabic (suffix) element causing the sonority principle to be violated.

Regularities, also in the Sonority Distance Hypothesis (mentioned above), can be expected in primary languages. They have not, however, been examined enough in non-primary languages, such as child-language, *second language*, distorted speech, etc.

In the last decade of the previous century assumptions were made for second languages or interlanguages (ILs) that

a. The forms, or representations, that L2 learners produce are systematic[4];
b. L2/FL learners internalise a series of rule systems which may be separate from both the native language (NL) and the target language (TL);
c. Interlanguages are in some well-defined sense simpler than the TL in question.

If the IL and target language are related through markedness statements, the IL and TL are related the same way that other genetically unrelated languages are related. But what if they are not related and the IL tends to break TL rules rather than be related to them?

1.1 Experiment

Part of the reading test administered to the respondents (cf. test types and administration of tests) consisted of a list of selected words with two-member and three-member codas. Some of the words dealt with in this part of the study also originate from the core of the test, namely the sentences at the very beginning of the test and general word lists. Due to the length of the whole test

[4] Corder Pit, "The Significance of Learners' Errors", *International Review of Applied Linguistics* 5 (1967), pp. 161–169.

it was necessary to reduce the word lists for the fifth-graders (their concentration span would not allow them to read the required words adequately, since they were placed at the very end of the test). The respondents were given no instructions as to what they were reading or how they should read it. The aim of the word list was to give some insight into the Slovene speakers' interlanguage (processes and rules) regarding final consonant clusters. It was also desirable to establish whether the rules of this interlanguage corresponded to the rules of primary languages in general or not. The advantage of this study as regards the presented problem is not so much in the number of items as it is in the selection of respondents, who are representatives of all Slovene regions, which eliminates dialect interference. The results of the data are presented for all four age groups.

1.2 Questions which need to be asked in relation to consonant clusters

(1) With voiced one-member codas, Slovene speakers of English will simplify the pronunciation of codas by pronouncing them as voiceless rather than voiced (due to universal markedness rules of simplification and the fact that it is the unmarked feature for Slovene obstruent codas in general). Voiceless codas are expected to remain unchanged.
(2) With two member codas, Slovene speakers of English will simplify plosive-fricative codas by means of metathesis resulting in the fricative--plosive coda-structure. Three-member codas consisting of one fricative and two plosives or one plosive and two fricatives are also expected to result in two-member codas preferably of the fricative-plosive type. (cf. also question (4)).
(3) Voiced/lenis two-member codas consisting of plosive-fricative or fricative-plosive will be simplified to appear as voiceless codas irrespective of the sequencing of fricatives and plosives, since in one-member codas the plosives and fricatives are both rendered voiceless before a pause. Voiceless two-member codas will remain unchanged.
(4) The reaction of native speakers of English to a three-member cluster is to shorten it in such a manner that the suffix is maintained (i.e. the third person singular "s", plural inflection "s", regular past tense suffix "-ed"). They will pronounce a word like "rafts" as "rafs", namely with a F-F coda cluster. Speakers of English as L2/FL are expected to omit the last element, e.g. pronounce a word like "rafts" as "raft" or reduce the final cluster to produce a form such as "rats". It is difficult to predict which of the two variants (the F-P or the P-F) they are most likely to produ-

ce. The Marked Cluster Constraint (MCC)[5], however, predicts that final tri-literal or three-member clusters which underlyingly consist of two stops and one fricative or two fricatives and one stop, should be shortened to S-F or F-S clusters rather than S-S or F-F, which are more marked than the former. This would be a characteristically interlanguage feature, differing entirely from TL solutions. It was assumed that Slovene speakers of English will resort to the same forms of simplification when it comes to three-member codas.

1.3 Results and comments

Comments on (1): Neutralisation of voiced and voiceless obstruents in final position is a characteristic feature of Slovene phonology (similar to that of German and Russian). Fortition of voiced/lenis obstruents in codas would thus normally be treated within the framework of L1 or even dialect interference[6]. However, as will be mentioned in the following, proof has been found that fortition of final obstruents can be a strategy of L2 learners for simplification, so that it became an interlanguage rule, independent of both, the L1 and the L2/FL.

Broselow[7] studied coda stops in the English speech of Mandarin speakers. As neither voiced or voiceless stops are permitted in Mandarin codas, the asymmetry between voiced and voiceless coda stops with Mandarin speakers producing English words came as something unexpected. It would seem more logical that voiced and voiceless codas caused the same amount of difficulty for speakers who had neither in their L1. The prevailing portion of voiceless scores also for voiced coda stops in the case of Mandarin speakers gives rise to scepticism toward the claim that the same phenomenon in the case of Slovene speakers could be attributed entirely to L1 interference. Slovene speakers neutralise the word-final obstruents before a pause or another obstruent in their L1, which conveniently served as an explanation for replacing voiced codas with voiceless variants in their pronunciation of English. Judging from the Mandarin example, some of the erroneous voiceless scores could be explained by L1 interference. However, the general human/physiological factor, that is the limitations of the human vocal tract, should also be taken into consideration. Or to

5 Fred Eckman, "The Reduction of Word-final Consonant Clusters in Interlanguage", in: *Sound Patterns in Second Language Acquisition*, ed. Allen James and James Leather (Dordrecht, 1987), pp. 143–162.

6 Klementina P. Jurančič, *The Pronunciation of English in Slovenia* (Maribor, 2007).

7 Ellen Broselow, "The Emergence of the Unmarked in Second Language Phonology", *Studies in Second Language Acquisition* 20, No. 2 (1998), pp. 261–280.

put it in linguistic terms because voiceless stops are generally considered less marked than voiced stops in coda position, Eckman's Markedness Differential Hypothesis predicts that the less marked voiceless stops should be easier for learners than the more marked voiced stops.

In the following we refer to the results of our study regarding voiced codas.

Processes like elision, epenthesis and devoicing are characteristic of the Slovene speakers'/students' IL, however, unlike the other elements of the IL – especially L1 interference, which do not occur with the native speaker of English, speech errors do occur (randomly). While the source for the IL devoicing rule can be found in the source langauge/L1 (i.e. Slovene) phonology, explanations for ellipsis and epenthesis are not particularly readily found in the L1 and L2 phonology/grammar.

Comments on (2 and 3): Developmental substitutions usually include cluster simplification processes, such as deletion of a consonant, vowel or consonant epenthesis or metathesis.

From the developmental point of view it can be said that, in the case of S-S and F-S codas, reading English words with S-S and F-S clusters elicits simplification processes such as epenthesis with younger Slovene speakers (cf. *Tables 1–11*; fifth-graders) and devoicing to complete voicelessness with older speakers (cf. *Tables 1–11*; third year). Different strategies are thus employed at different levels. The developmental aspect also helps to prove that devoicing is a strategy of simplification more present in voiced S-F codas (cf. *Table 5*, third year) than in voiced F-S codas (cf. *Table 3*, third year). In the case of younger speakers, it is impossible to compare the results for "rubs" and for "buzzed", since the latter was almost always produced by means of the insertion of an intervening vowel between the /z/ and /d/, probably as a result of orthographic interference.

The simplification rule of devoicing in the case of Slovene speakers of English does not only hold for one-member voiced codas, but also for two-member voiced codas, especially those containing two stops or a stop and a fricative. E.g. [-bz] in "rubs" was mainly pronounced as voiceless [-ps]. This devoicing is an unmarked feature compared to the opposite process, which would be voicing of voiceless /-ts/ e.g. in "puts" or "lets". These two were never pronounced as voiced in our study.

The same words "lets" and "puts" (cf. *Table 2*) demonstrate yet another point. Slovene speakers of English will never, or hardly ever, simplify two-member S-F codas by means of a F-S coda, even though this would be abiding by rules of the UCSS. On the contrary, there is proof in our study (cf. *Table* for "nest") of a preference by Slovene learners of English (as a Slovene-English inter-language rule) to replace less marked F-S codas with the more marked S-F ones. In this

they are breaking the Sonority Distance rule.

In the case of the word "clothes" (cf. *Table 7*), the most frequent reaction of native speakers of English is to produce a uni-literal/one-member coda rather than a bi-literal/two-member one, usually by omitting the first fricative. The Slovene speakers of English in our study seldom did that. They preferred to use a less marked coda than the target one (namely the P-F as opposed to the target F-F) maintaining the number of members, They used the dental or alveolar plosive instead of the dental fricative. ("clothes": /kl ↓ð/ pronounced as [kl ↓ð] by native speakers of English and usually as [kl ↓d͡z] or [kl ↓t͡s] by Slovene speakers of English).

Further evidence for the preference of S-F codas by Slovene learners of English is the reduction of the three-member F-S-F coda in "nests" (cf. *Table 12*) to [-ts], a S-F coda. The shortening in itself follows the rule of markedness, the two-member coda being less marked than the three-member one, and it also follows the MCC (cf. (4) above), but it breaks the sonority distance rule, namely the preference of a F-S coda over the S-F one.

Comments on (4): Many studies on syllable structure have found that markedness of both onsets and codas increases with length. Some studies in interlanguage phonology have revealed that shorter onsets and codas are preferred over longer onsets and codas. If the length of consonant clusters is modified, less marked clusters result. It was observed in the study that younger speakers especially found it difficult to reduce final consonant clusters by means of elision. Instead they used vowel epenthesis, especially if the cluster also contained the regular past tense inflection -ed (cf. responses for "bugged", "buzzed", "backed", "stopped", and particularly "gasped", "lisped", etc.), and pronounced -ed as [↓d] or [↓t].

The MCC predicts that speakers of English as L2 will reduce final three--member consonant clusters to two member ones, but that it is difficult to say which consonant will be left out, and which two remain. The only thing that is certain is that it will most probably contain a F and a S, irrespective of order. Our results show that in most cases of epenthesis, the remaining cluster did include a F and a S, but it was normally the case that the consonant representing the inflectional morpheme was omitted (cf. responses for "lisped" and "gasped"). Or for example in the case of "acts", the most frequent erroneous response type was "act", and seldom "axe". With more complicated codas, namely four-member ones, like in "sixths" and "twelfths" (*Tables 10 and 11*), the central consonants in the coda were omitted on account of the plural inflectional morpheme -s, creating less marked two member codas in the case of "sixths" ↓[s ↓ks] and three member codas in the case of "twelfths" ↓[twelfs] which is also the usual L1 elision of English speakers. The problem with words like "clothes", "sixths"

and "twelfths" is that they involve a dental fricative, which is not part of the Slovene sound system. Slovene learners of English are well aware of this sound (or sounds), they also (with few exceptions) know how to pronounce it, but still they will not use it (in single consonant clusters they will use them more frequently than in two or more member cluster). Therefore, this sound is part of their "internalised description", but not their performance. The dental fricative is replaced by the dental stop by Slovene speakers of English.

Tables with data on final consonant clusters in the words "nest", "puts", "clocks", "buzzed", "closed", "rubs", "bugged", "backed", "stopped", "leaves", "clothes", "lisped", "gasped", "waxed", "sixths" and "twelfths":

Responses for coda in "nest"

Table 1: Number of responses for final fortis (F+S) consonant cluster in "nest" for seventh grade, first year and third year and in "cost" for 5 graders; scores in (%) for correct responses (the unmarked feature), for metathesis of final consonant cluster (the marked feature), scores for epenthesis and elision and other

		- marked	+marked	epenthesis		elision	+marked	
nest	n resp	[-st] (FS_{vcl}) %	[-ts] (SF_{vcl}) %	[-tst] (SFS) %	[-sts] (FSF) %	[-s] (F) %	[-ss] (FF) %	other %
5 grade	114	87.7	0.7	0.0	0.0	1.8	0.0	9.2
7 grade	105	88.6	6.7	1.0	1.9	0.0	1.0	0.9
I year	30	86.7	3.3	3.3	6.7	0.0	0.0	0.0
III year	26	92.3	7.7	0.0	0.0	0.0	0.0	0.0

Responses for coda in "puts" and "clocks"

Table 2: Number of responses for final fortis (S+F) consonant cluster in "puts" and "clocks" for seventh grade, first year and third year; scores in (%) for correct responses (marked compared to "nest", for metathesis of final consonant cluster (the unmarked feature), scores for epenthesis and elision and other

		+marked	-marked	epenthesis	elision	marked	
puts/ clocks	n resp	[-ts/-ks] (SF_{vcl}) %	[-st/-sk] (FS_{vcl}) %	[-tst] (SFS) %	[-t/-k] (S) %	[-kt] (SS) %	other %
7 grade	213	92.4	0.5	1.9	3.8	0.5	0.0
I year	60	98.3	1.7	0.0	0.0	0.0	0.0
III year	52	98.1	0.0	0.0	0.0	0.0	1.9

Responses for coda in "buzzed"

Table 3: Number of responses for final lenis (F+S) consonant cluster in "buzzed" for firth grade, seventh grade, first year and third year; scores in (%) for correct responses (marked compared to "nest", unmarked compared to "rubs") and for fortition in the final cluster (the marked feature), scores for epenthesis and elision and other

		-marked	+fortis	epenthesis		
buzzed	n resp	[-zd] (FS_{vd}) %	[-st] (FS_{vcl}) %	[-z ɗ] (FVS_{vd}) %	[-z ʇ] (FVS_{vcl}) %	other %
5 grade	109	9.2	0.9	74.3	12.8	2.8
7 grade	108	30.5	13.0	41.7	13.0	1.9
I year	28	39.3	39.3	21.5	0.0	0.0
III year	27	59.3	1.5	25.9	0.0	0.0

Responses for coda in "closed"

Table 4: Number of responses for final lenis (F+S) consonant cluster in "closed" for 5 grade, 7 grade, I year and III year; scores in (%) for correct responses (marked compared to "nest", unmarked compared to "rubs") and for fortition in the final cluster (the marked feature), scores for epenthesis, epithesis, metathesis and other

		-marked	+fortis	epenthesis		elision	metath	
closed	n resp	[-zd] (FS_{vd}) %	[-st] (FS_{vcl}) %	[-z ɗ][-z ʇ] (FVS_{vd}) (FVS_{vcl})	[-s ɗ][-s ʇ] (FVS_{vd}) (FVS_{vcl})	[-z][-s] (F_{vd})(F_{vcl})	[-ts] (SF) %	other %
5 grade	106	20.8	9.4	20.8/5.7	5.7/27.4	7.5/2.8	0.9	0.9
7 grade	106	40.6	22.6	5.7/2.8	10.4/9.4	3.8/0.0	1.9	2.8
I year	28	67.8	25.0	3.6/0.0	0.0/0.0	3.6/0.0	0.0	0.0
III year	29	72.4	13.8	6.9/0.0	0.0/0.0	3.4/0.0	3.4	0.0

Responses for coda in "rubs"

Table 5: Number of responses for final lenis (S+F) consonant cluster in "rubs" for 5 grade, 7 grade, I year and III year; scores in (%) for correct responses (marked compared to "puts", unmarked compared to "bugged") and for fortition in the final cluster (the marked feature), scores for epenthesis and elision and other

			+fortis	epenthesis	elision	
rubs	n resp	[-bz] (SF_{vd}) %	[-ps] (SF_{vcl}) %	[-b ƨ/-b ꞩ] (SVF) %	[-b] (S) %	other %
5 grade	94	20.2	76.6	0.0	0.0	3.2
7 grade	105	26.7	71.4	0.0	0.9	0.9
I year	27	37.0	59.3	0.0	0.0	3.7
III year	27	29.6	66.7	3.7	0.0	0.0

Responses for coda in "leaves"

Table 6: Number of responses for final lenis (F+F) consonant cluster in "leaves" for 5 grade, 7 grade, I year and III year; scores in (%) for correct responses and for fortition (the marked feature), scores for epenthesis and elision and other

			+fortis	epenthesis	elision		
leaves	n resp	[-vz] (FF_{vd}) %	[fs] (FF_{vcl}) %	[v ꞩ] (FVF) %	[-f/-v] (F_2) %	[-z] (F_2) %	other %
5 grade	109	29.4	35.8	27.5	3.7	2.8	0.9
7 grade	106	49.0	42.5	5.7	1.9	0.9	0.0
I year	31	61.3	35.5	3.2	0.0	0.0	0.0
III year	28	50.0	42.9	3.6	3.6	0.0	0.0

Responses for coda in "clothes"

Table 7: Number of responses for final lenis (F+F) consonant cluster in "clothes" for 5 grade, 7 grade, I year and III year; scores in (%) for correct responses and those +fortis; and for F_1 S_1, scores for epenthesis, metathesis, elision and other.

			+stop	+ stop +fortis	elision	elision	epenth.	epenth.+ metath.	metath	
clothes	n resp	[ʒ]] ʂ] (FF_{vd})/(FF_{vcl})	[dz] (SF_{vd})	[ts] (SF_{vcl})	[z]/[s] ($F2_{vd}$/$F2_{vcl}$)	[t][ɟ] (S_1)/(F_1)	[t ʂ] (SVF)	[s ɬ][z ɖ] (FVS_{vcl}) (FVS_{vd})	[st][zd] (FS_{vcl}) (FS_{vd})	other %
5 grade	114	0.0/0.0	4.4	37.7	14.0/4.4	2.6/1.7	14.0	4.4/2.6	0.9/2.7	10.5
7 grade	95	1.1/1.1	6.3	72.6	15.8/4.2	1.1/2.1	6.3	1.1/0.0	1.1/1.1	1.1
I year	29	0.0/0.0	17.2	51.8	10.3/13.8	0.0/0.0	0.0	0.0/0.0	0.0/0.0	6.9
III year	27	0.0/3.7	14.8	63.0	7.4/0.0	0.0/7.4	0.0	0.0/0.0	0.0/0.0	3.7

Responses for coda in "lisped" and "gasped"

Table 8: Number of responses for final fortis (F+S+S) consonant cluster in "lisped" and "gasped" for 5 grade, 7 grade, I year and III year; scores in (%) for correct responses and those +lenis; scores for epenthesis, metathesis, elision and other

			+lenis	epenthesis		epithesis			elis. +meta.	
lisped gasped	n resp	[-spt] (FSS) %	[-zbd] (FSS) %	[-sp ɬ] (FSVS) %	[-sp ɖ] (FSVS) %	[-pt] (SS) %	[-sp] (FS_1) %	[-st] (FS_2) %	[-ps] (S_1F) %	other %
5 grade	206	9.2	0.5	19.4	65.0	0.0	1.5	0.0	0.9	3.4
7 grade	219	36.5	0.4	18.7	34.7	0.9	2.3	1.4	1.4	3.2
I year	54	70.3	0.0	7.4	20.4	0.0	0.0	0.0	0.0	1.9
III year	50	52.0	0.0	16.0	24.0	0.0	2.0	4.0	0.0	2.1

Responses for coda in "waxed"

Table 9: Number of responses for final fortis (S+F+S) consonant cluster in "waxed" for 5 grade, 7 grade, I year and III year; scores in (%) for correct responses; scores for epenthesis, metathesis, elision and other

			epenthesis			epenth+elis.	elision	
waxed	n resp	[-kst] (SFS) %	[-ks ɗ] ($SFVS_{vd}$)	[-ks t̬] ($SFVS_{vcl}$)	[-kst t̬] (SFSVS)	[-k ɗ/t] (SVS) %	[-ks] (SF) %	other %
5 grade	105	15.2	56.2	18.1	0.9	3.8	2.9	2.9
7 grade	107	38.3	34.6	19.6	1.9	1.9	0.9	2.8
I year	31	80.6	9.7	6.6	0.0	0.0	0.0	3.2
III year	28	85.7	3.6	10.7	0.0	0.0	0.0	0.0

Responses for coda in "twelfths"

Table 10: Number of responses for final fortis (L+F+F+F) consonant cluster in "twelfths" for 7 grade, I year and III year; scores in (%) for correct responses; scores for epenthesis, metathesis, elision and other

				metath.	epenth.	elision	elision	elision	elision	
twelfths	n resp	[-lfTs] (LFFF) %	[-lfts] (LFSF)%	[-lfst] (LFFS) %	[-lft«s] (LFSVF)	[-lfs] (LFF)	[-lft] (LFS)	[-lts] (LSF)	[-lf] ($-LF_1$)	other %
7 grade	105	1.9	22.9	4.8	2.9	58.0	3.8	1.9	0.9	2.9
I year	28	3.6	28.6	10.7	0.0	46.4	3.6	0.0	7.2	0.0
III year	27	4.7	11.1	3.7	0.0	55.5	7.4	7.4	3.7	3.7

Responses for coda in "sixths"

Table 11: Number of responses for final fortis (L+F+F+F) consonant cluster in "sixths" for 7 grade, I year and III year; scores in (%) for correct responses; scores for elision of various types and other

					elision	elision	elision	elision	
sixths	n resp	[-ksTs] (SFFF)%	[-ksts] (SFSF)	[-ksti] (SFSV)	[-kst] (SFS) %	[-ks] (SF) %	[-kts] (SSF) %	[-st] (FS)	other %
7 grade	108	1.9	30.6	6.5	26.9	23.1	7.4	0.0	3.7
I year	28	3.6	39.3	0.0	28.6	21.4	3.6	0.0	3.6
III year	26	3.8	53.8	0.0	30.8	7.6	0.0	3.8	0.0

Responses for coda in "nests"

Table 12: Number of responses for final fortis (F+S+F) consonant cluster in "nests" for 5 grade, 7 grade, I year and III year; scores in (%) for correct and for elision in the final cluster into S+F clusters or F+S clusters, repectively, scores for epenthesis and other

			elision	**elision**	**epenthesis**	
nests	n resp	[-sts] %	[-ts] (SF) %	[-st] (FS) %	[-stIs] (FSVF) %	other %
5 grade	106	98.6	2.4	3.8	0.0	0.9
7 grade	105	80.9	9.5	5.7	1.9	1.9
I year	30	86.7	6.7	0.0	0.0	6.6
III year	28	96.4	3.6	0.0	0.0	0.0

2. Optimality Theory and final consonants (consonant clusters) in the pronunciation of English by Slovene learners

The research on the pronunciation of English in Slovenia employed both approaches to research, namely the inductive method and the deductive approach. The part using the inductive approach was conducted with a non-experimental causal pseudo-longitudinal descriptive method accompanied by a statistical analysis of data collected during fieldwork. Test items were chosen based on (strong) contrastive analysis (CA) the possible and potential differences between the sound systems of individual Slovene dialects and the sound system of the target foreign language, namely English, were determined. With respect to the latter, the British variety was chosen because this was the variety taught in schools. The American variety of English, however, due to limitless exposure, could not be ignored, which is why it was necessary in the analysis to employ strategies separating results which could be attributed to the influence of this target variety from results of L1 dialect interference. Error analysis (EA) was used in the treatment of data, namely analysis both of errors and non-errors, to identify the features in the pronunciation of informants which could be attributed to L1 dialect interference, longside accounting for other potential sources of interference such as influence of the target General American English, orthographic interference especially in the case of reading tests, influence of the test situation resulting in speech errors etc. Results were presented in tables in explained in the discussion (cf. Jurančič (2007)).

The second part of the study was designed in a deductive manner. The aim was to test Eckman's (1977) Markedness Differential Hypothesis in the pronun-

ciation of English consonant clusters by Slovene learners. Tests were designed to observe how Slovene learners would tackle English coda consonant clusters, which in sonority distance differ from Slovene ones and would thus be subject to potential L1 interference also in this respect. All 287 respondents participating in the first part of the study (5th graders and 7th graders of primary schools, and 1st year students and 3rd year students of secondary schools from all 7 dialect regions) took part also in this segment, the only adjustments made were fewer examples for the fifth graders, because they were beginners learners of English.

Results for MDH are presented in the previous chapter, while results for OT are presented in this chapter.

MDH has proven to be useful not only in explaining the influence of sonority distance on potential pronunciations of coda consonant clusters and by comparing markedness in different languages also pointing out possibilities of choice making in learners of English as a foreign language, considering sonority rules in both languages, it is also a useful tool for discussing decision-making when processes in coda consonant clusters are dealt with by Optimality Theory[8]. As it happens, the exact same processes usually dealt with by Optimality Theory in relation to cusonant clusters, namely fortition, epenthesis and elision, were found to occur in the pronunciation of coda consonant clusters administered to the respondents as part of the MDH study. For this reason, we shall discuss some of the most prominent examples fortition, epenthesis and elision dealt with by means of Optimality Theory.

An Optimality Theory (OT) grammar is an input-output device in which the optimal candidate is selected from a set of other condidates generated by the grammar. In this theory, generalizations are expressed in terms of ranked constraintsrather than rules. Candidates are evaluated simultaneously to sellect the most harmonic output. The most harmonic, i.e. the 'winning' candidate is the one that incurs fewest violations of higher ranked constraints[9].

Most importantly, OT explains decision-making of the users of a certain language in terms of preferences of pronunciation outcomes with regard to phonological features relating to that language. It also accounts for possible cross-linguistic influences including them into the ranking order of the regular features of the language treated with OT (e.g. accounting for general phonological features of Slovene in the pronunciation of English by Slovene learners as a possible source of influence).

[8] Alan Prince and Paul Smolensky, *Optimality Theory: Constraint Interaction in Generative Grammar* (New Brunswick, 1993).

[9] Konert-Panek Monika, *From Mentalism to Optimality Theory – Notion of the Basic Phonological Segment* (Warsaw, 2021).

Constraints used in this study are divided into Markedness Constraints and Faithfulness Constraints.

Markedness Constraint	Faithfulness Constraint
AGREE (voice): Agree in specification of voice =*OBSTRUENT (voice)	MAX-IO: Maximize all input segments in the output (no delition) DEP-IO: Output segments are dependent on having an input correspondent (prevents insertion) IDENT-IO (voice) Correspondent segments must agree in voicing

Kager[10] estimates unmarked values being cross cross-linguistically preferred and basic in all grammars, and marked values being cross-linguistically avoided and used by grammars only to create contrast, which means that markedness constraints overall reinforce well-formedness of the output candidate, prohibiting structures that are difficult to produce or comprehend.

In contrast, faithfulness is understood as the combined grammatical factors that 'preserve the lexical contrasts'. Faithfulness constraints demand similarity between input and output (candidates).

The interaction of faithfulness and markedness constraints leads to the optimal choice. This can be illustrated with the regular pluralization process which (alongside the formation of the third person singular and regular past tense forms) constitutes the majority of examples dealt with in this chapter on OT and the pronunciation of English by Slovene learners.

If in a phonology GENerator generally creates infinite sets of theoretically possible candidates for output (e.g. plural of bag – bags /bæg+z/: bægz, bægs, gægs, bæks, bæg s, bækz, bæg z, bæg dæg, b gz,...n), the present study provides possible candidates for analysis on the basis of actual pronunciation variants of coda consonant clusters by Slovene learners of English. Optimality Theory provides explanations to the decision-making process, accounting for the different pronunciation variants of plural and past tense structures forming final consonant clusters on the basis of phonological characteristics of English (in which the words are produced) and phonological characteristics of Slovene which is the respondents' native language and also a source of influence (especially neutralization of voiced and voiceless obstruents in word-final position (e.g. plural of leaf – leaves /li:f + z/: li:vz, li:fs, li:v s, li:v/f, li:z,.../. These variants serve as competing candidates in the OT analysis, the variant occurring most

[10] René Kager, *Optimality Theory* (Cambridge, 1999).

frequently (cf. tables in previous chapter, the MDH section) being the potential winner which is shown in the tableaux of ranking constraints and the degrees of violations of these constraints for each candidate.

The majority of cases in this study has to do with the English plural marker '-s' and the third person singular marker '-s' with the same two distributional variants in words like "nests", "clothes", "leaves", "puts", "rubs", and English past tense marker '-ed' in words like "waxed", "buzzed",... Generally, the interaction of faithfulness and markedness constraints lead to the optimal choice. The phonologically determined allomorphs in English for the plural marker '-s' have two realizations in terms of voicing: [s] and [z]. The choice of any of them depends on the voicing of the final sound of the respective noun where the pluralization takes place or the respective verb where third-person-singular form takes place. The phonologically determined allomorphs in English for past-tense marker '-ed', too, have two realizations in terms of voicing: [t] and [d], also depending on the voicing of the final sound of the respective verb in which transition to past-tense form takes place. In the case of Slovene learners of English, however, the neutralization of voiced and voiceless obstruents in word-final position needs to be taken into consideration when defining the hierarchy of constraints and the choice of constraints themselves. Namely, the ranking process of the constraints is crucial in achieving the optimal output.

OT thus provides a constraint-based competition system where a set of candidates (minimum two) compete among themselves. At least one of these candidates could be identical to the input and the rest are somewhat modified in the structure. Generally, the candidate identical to the input is the winner. This may not entirely be the case when it comes to candidates which are not 'perfect speakers', groups like producers of 'child language', 'sign language', etc. which in this study include learners of English as a second language. If in the choice and ranking of constraints of the former, general characteristics of 'child language' need to be taken into consideration, then in the choice and ranking of constraints of the latter (i.e. learners of English as a second language) need to consider the phonological features of those learners' first language (especially neutralization of voiced and voiceless obstruents in word-final position). This does not influence the winning candidates, but it does explain the discrepancy in the percentage of winning candidates identical to the input (lower in the case of nouns and verbs ending with lenis obstruents and therefore higher in the case of nouns and verbs ending with fortis obstruents which naturally coincide with the result of the neutralization of the word-final voiced and voiceless obstruents. For this reason, the examples in this study are here divided into two larger groups, depending on whether the noun or verb ends with a voiceless (fortis) consonant cluster or a voiced (lenis) one.

Especially in the group of nouns and verbs ending in voiced (lenis) codas, the constraint *OBSTRUENT(voice) or 'voiced/lenis consonant' in final position which is necessarily violated due to the feature neutralization of voiced and voiceless obstruents in final position (a characteristic of Slovene phonology), but in order for the Slovene learner to produce it correctly and for the winning output candidate to match the input in the tableau, the violation must be minimal.

Fig. 1: Tableau for /nests/

Input: /nest+s/ "nests"	MAX-IO	DEP-IO	IDENT (voice)	*OBSTRUENT (voice)
a. nests				
b. nets	*!			
c. nest	*!			
d. nest s		*!		

The competing candidates in *Fig. 1* are arranged according to the frequency of occurrence. *OBSTRUENT (voice) was allowed to be the lowest ranking constraint (most to the right in the table) due to correspondence with the neutralization of voiced and voiceless word-final consonant clusters in Slovene and did not need to be presented as a constraint normally violated in Slovene when it comes to lenis word-final obstruents. If all possible generated candidates were considered (e.g. nezdz, nezts, nesd,...) constraints *OBSTRUENT (voice) and IDENT-IO (voice) would possibly be violated at one point or the other, which is why they are included in the table. The winning output candidate *nests* corresponds to the input and at the same time to the highest percentage of the respondents' (i.e. Slovene leaners of English) actual responses. It does not violate any of the constraints, not even one, which testifies to the fact that it possibly presented least difficulties to Slovene learners pronunciation-wise.

Fig. 2: Tableau for /p ʦs/

Input: /pʊ+s/ "puts"	SSP - CODA F-P	NO CODA-METATHESIS	MAX-IO	DEP-IO
a. p ʦs	*			
b. p st		*!		
c. p ʦst	*			*!
d. p ʦ			*!	

The word "puts" in *Fig. 2* violates the sonority distance rule (or Sonority Sequence Principle – SSP) in its final consonant cluster. It was thus expected that the metathesis of the word-final consonant cluster (in order to rectify this issue) would account for the second largest number of responses in the pronunciation of English by Slovene learners, making it a competing CANdidate. This is why the constraint NO CODA-METATHESIS ranked second highest in the tableau.

Fig. 3: Tableau for /wækst/

Input: /wæks+t/ "waxed"	SSP - CODA F-P	MAX-IO	DEP-IO	*OBSTRUENT (voice)
a. wækst	*			
b. wæks ɗ/t	*		*!	
c. wækst ɬ	*		*!*	
d. wæks	*	*!		

In the case of the word "waxed" in *Fig. 3* the sonority distance rule SSP - CODA F-P is also violated, but not enough to exclude any of the CANdidates from the competition. Metathesis in the coda consonant cluster was not considered a constraint, because it did not occur in any of the competing pronunciation variants of the word in question. It is assumed that the violating of the sonority distance rule in the final consonant cluster, however minimal, in the initial phases of the pronunciation process did pose a certain amount of difficulty in the pronouncing of this word compared to the word "nest" where such a violation was not necessary.

Fig. 4: Tableau for /nest/

Input: /nest/ "nest"	MAX-IO	DEP-IO	SSP - CODA F-P	*OBSTRUENT (voice)
a. nest				
b. nets			*!	
c. netst		*	*!	
d. nes	*!			

Unlike the plural form of the word "nest", namely "nests" in *Fig. 1*, the singular form "nest" in *Fig. 4* itself can account also for the sonority distance rule F-S of the coda consonants, considered the highest-ranking constraint assigned to

CANdidates produced by Slovene learners of English for the word "nest". There is no ambiguity as is in the case of "nests", where it is impossible to say whether "nets" is the result of elision and metathesis, or elision without metathesis. This is also why the constraint SSP - CODA F-P was not included in "nests".

English items/words respondents (Slovene learners of English as FL) were asked to pronounce which contain a voiced/lenis coda instigating the need for accounting for the constraint IDENT-IO (voice) as one of the higher-ranking constraints.

The treatment of these words can be compared to the treatment of so-called 'child language' and is due to the imperfection of pronunciation of English as a foreign language dealt with in a similar manner as 'child language is treated (as opposed to the treatment of a 'perfect speaker' in the case of any language, the phonology of which is part of the L1. The pronunciation of a foreign language is automatically 'contaminated' with interfering phonological characteristics of the speaker's native language which is why these characteristics cannot be ignored (even though if the examined items have no connection with the native language)).

Example of the treatment of L1 'child language' and how it differs from OT treatment of so-called perfect adult pronunciation of the L1 (cf. Boersma (2003))[11].

Tableaux for potential pronunciation candidates for "duck" (Fig. 5) and for perceived candidates for "duck" (Fig. 6):

Fig. 5: The child's production of "duck" (adapted from P. Boersma (2003): The child's production of "cat") to demonstrate high-ranking constraints represented by phonological characteristics of imperfect "child-language", a developmental stage towards perfect "adult language"

Input: /dʌk/ "duck"	NO-CODA	DEP-IO	IDENT-IO	MAX-IO
a. d ʌ k	*!			
b. d ←				*
c. d ʌ k i		*!		
d. d i ←			*!	

[11] Tableaux for potential pronunciation candidates for "duck" and for perceived candidates for "duck" were adapted by Paul Boersma, "Optimality Theory and Phonological Acquisition", *Annual Review of Language Acquisition* 3 (2003), pp 1–50.

Fig. 6: Child's comprehension of "duck" (adapted from P. Boersma (2003): The child's perception of "cat"). The perceived candidate, not the produced candidate is also the desired IO candidate

Input candidates	Perceived candidates	NO-CODA	MAX-IO	IDENT-IO	DEP-IO
a. d ~~k~~	d ~~k~~	*			
b. d ←	d ~~k~~	*	*!	*	
c. ←	d ~~k~~	*	*!*		
d. d ~~g~~	d ~~k~~	*		*!*	
e. st ~~k~~i	d ~~k~~	*			*!*

Tableaux for potential pronunciation candidates for "bag" (Fig. 7) and for perceived candidates for "bag" (Fig. 8):

Fig. 7: The Slovene learners' production of "bag" (adapted from The child's production of "duck" in *Fig. 5*) to demonstrate high-ranking constraints represented by phonological characteristics of imperfect FL pronunciation including L1 phonological features, a developmental stage towards perfect "native-like pronunciation of FL/L2"

Input: /bæg/ "bag"	CODA OBSTRUENT (voice)	DEP-IO	IDENT-IO	MAX-IO
a. bæg	*!			
b. bæk			*	
c. bægi		*!		
d. bæ				*!

Fig. 8: Slovene learner of English's comprehension of "bag" (adapted from Child's comprehension of "duck" in *Fig. 6*). The perceived candidate, not the produced candidate is also the desired IO candidate

Input candidates	Perceived candidates	CODA OBSTRUENT (voice)	IDENT-IO	MAX-IO	DEP-IO
a. bæg	bæg	*			
b. bæk	bæg		!*		
c. bægi	bæg	*			*!*
d. d ~~g~~	bæg	*	*!*		
e. bæ	bæg	*		*!*	

The following tables will include *OBSTRUENT (voice) as the highest-ranking constraint, because the perceived candidate and not necessarily the produced candidate (taking into account the voiceless neutralization of voiced and voiceless word-final obstruents) is the desired IO candidate.

Also, it is the key assumption of optimality theory that the resolution to the conflicts among the universal constraints are the grammars and the differences between various languages rest in different rankings of a single set of universal constraints. 'Reranking' of constraints thus constitutes the grammars of languages and resolves conflicts arising from dealing with the second or foreign language rather than the first or native one, which is the case of the present research.

Fig. 9: Tableau for /b ƶd/

Input: /bƶ+d/ "buzzed"	CODA OBSTRUENT (voice)	IDENT-IO (voice)	MAX-IO	DEP-IO
a. b ƶd	*			
b. b ʂt		*!*		
c. b ƶ ɖ/t	*			*!

The words "buzzed" and "closed" were chosen to be dealt with first in this group in terms of OT due to their not violating the sonority distance rule in the word final consonant cluster, namely by preserving the sequence F-S. However, as is the case in all of the words in this group, despite them being English words with a high frequency of occurrence, the were pronounced by Slovene learners of English and it was necessary to take into consideration a potential source of interference the general phonological characteristic of Slovene as a native language, namely the neutralization of word-final voiceless and voiced obstruents into resulting voiceless ones to the extent that speakers are not even aware of this when it comes to Slovene lenis word-final obstruents, because they associate them with the spelling ("med" /met/ En.: *honey* vs. "medu" /me'du/ as in "Ni medu", En.: "There is no honey", convinced that they pronounce the letter "d" as the sound /d/ in both cases. In truth, "med" is systemically pronounced as /met/ (voiceless), especially before a pause, and so are all the other word-final obstruents in the Slovene consonant sound system. For this reason we shall in all the following tables consider the *OBSTRUENT (voice) constraint as highest ranking in the tableau and when violated in order to achieve the winning IO candidate, the violation (as in the case of violating the constraint NO CODA in 'child language' which should be minimal when the desired CODA results are the goal), here, too, should be minimal.

Fig. 10: Tableau for /kl ~~ɘ~~zd/

Input: /kl~~ɘ~~z+d/ "clothes"	CODA OBSTRUENT (voice)	IDENT-IO (voice)	MAX-IO	DEP-IO	SSP - CODA F-P
a. kl ~~ɘ~~zd	*				
b. kl ~~ɘ~~st		*!*			
c. kl ~~ɘ~~z ~~ɘ~~d/t	*			*!	
d. kl ~~ɘ~~z/s	*		*!		
e. kl ~~ɘ~~ts					*!

The pronunciation of the word "clothes" by Slovene learners of English had several competing outputs, the winning candidate being /kl ~~ɘ~~zd/ minimally violating the highest-ranking constraint of neutralization of voiced and voiceless word-final obstruents characteristic of Slovene phonology. It is a characteristic the Slovene learner of English needs to overcome in order to pronounce the word-final consonant cluster correctly and not violate the IDENT-IO (voice) constraint, which is in the second candidate /kl ~~ɘ~~st/ fatally violated, excluding it fairly early from the competition. Candidates c. and d. were excluded after fatally violating DEP-IO with epenthesis and MAX-IO with elision, respectively. Since MAX-IO allows for epenthesis, but not for elision, it is here presented as higher ranking than DEP-IO. Candidate e. through metathesis fatally violates the sonority sequence principle (CODA F-S)[12]. This candidate, however, did not violate the *OBSTRUENT (voice) constraint. It can be assumed that Slovene learners of English are not encouraged to violate a constraint which naturally makes the pronunciation of the word-final consonant cluster easier.

Fig. 11: Tableau for /li:vz/

Input: /li:v+z/ "leaves"	CODA OBSTRUENT (voice)	IDENT-IO (voice)	MAX-IO	DEP-IO
a. li:vz	*			
b. li:fs		*!*		
c. li:v ~~s~~	*			*!
d. li:v/f li:z	*		*!	

[12] SSP in the tableau stands for Sonority Sequencing Principle, which basically means the same as the "sonority distance rule". It is a syllable well-formedness principle that states that the relative sonority of the segments should rise from an onset to nucleus and decline from the nucleus to coda. Following SSP, and onset cluster should have an increasing sonority, while a coda cluster should have a decreasing sonority.

The word "leaves" provides a similar set of candidates as "clothes" instigating the same ranking order of constraints and resulting in similar exclusions of candidates due to fatal violations of those constraints. The constraint SSP - CODA F-P, however, was not included in the ranking order, since no pronunciation variants by Slovene learners of English occurred in this word involving metathesis of the final consonant cluster.

Fig. 12: The expected outcome for the pronunciation of the word "clothes" by Slovene learners of English considering the neutralization of voiced and voiceless obstruents in word-final position being the subconscious constraint (and therefore higher ranking) and the preservation of place (dental) being the conscious constraint

Input: /klœz/ "clothes"	CODA OBSTRUENT (voice)	IDENT-IO (voice)	MAX-IO	DEP-IO	NO METATHESIS	PLACE (dental)
a. kl ~~œz~~	**					
b. kl ~~œs~~		*!				
c. kl ~~œs~~						*!
d. kl ~~œz~~	*		*!			
e. kl ~~œ s~~				*!		*
f. kl ~~œz~~d	**				*!	*

In the case of the word "clothes" (cf. *Fig. 12*) the constraint *OBSTRUENT (voice) was highest-ranking due to the assumption that Slovene learners of English employed neutralization of voiced and voicless word-final obstruents subconsciously, and it was not considered a fatal violable constraint, which would still make the candidate a. the winning candidate. The constraint PLACE (dental), a phonological characteristic of one of the sounds in the word-final consonant cluster, was considered a conscious constraint which is why it was ranked lowest to enable the candidate a. kl ~~œz~~ to win.

However, what happened in reality (cf. *Table 7*) was that Slovene learners of English mostly opted for not only neatralization of voiced and voiceless word final obstruents but also violation of place in the case of the dental fricative, which brough about the need for reranking the constraints and placing the constraint PLACE (dental) second highest in the hierarchy in order to obtain the actual winning candidate in the tableaux, namely c. kl ~~œs~~ (cf. *Fig. 13*). The change can be explained by shifting the assumption that Slovene learners of English were not aware of the neautralization of voiced and voicelss word-final obstruents, which could result in b. kl ~~œs~~ rather than a. kl ~~œz~~ would be the winning candidate and they would be aware of PLACE (dental) since it does not exist in the Slovene sound system for fricatives. As it happens, supported by results in *Table 7*, Slovene learners of English cannot count on awareness of

PLACE (dental), which makes it, like neutralization, a subconscious phonological characteristic.

Fig. 13: The actual outcome for the pronunciation of the word "clothes" by Slovene learners of English considering the neutralization of voiced and voiceless obstruents in word-final position being the subconscious constraint (and therefore higher ranking) and the preservation of place (dental) also being a subconscious constraint

Input: /klʊðz/ "clothes"	CODA OBSTRUENT (voice)	PLACE (dental)	MAX-IO	DEP-IO	NO METATHESIS	IDENT-IO (voice)
a. kl ~~ʊðz~~	*!*					
b. kl ~~ʊðs~~						*!*
c. kl ~~ʊðs~~		*				
d. kl ~~ʊðz~~	*		*!			
e. kl ~~ʊðs~~		*		*!		
f. kl ~~ʊðz~~d	**	*			*!	

The word "rubs" (*Fig. 14*) is interesting for OT analysis, because it, unlike all the previous cases, would require the inclusion of the constraint SSP - CODA F-P. Its final consonant cluster violates this constraint. The results of the analysis of Slovene learners' pronunciation of this word showed that they had no difficulty in pronouncing the P-S final sequency resulting in no actual case of metathesis (e. g. r ~~ʒb~~), which is why it is not included in the tableaux as a candidate. The constraints are ranked in such an order as to assume that the winning candidate is also the correct candidate.

Fig 14: Tableaux for /r ~~þ~~z/, the winning candidate is the "correct" candidate

Input: /r~~þ~~b+z/ "rubs"	CODA OBSTRUENT (voice)	IDENT-IO (voice)	MAX-IO	DEP-IO
a. r ~~þ~~z	*			
b. r ~~þ~~s		*!*		
c. r ~~þ~~z ~~ʒ~~/s	*			*!
d. r ~~þ~~	*		*!	

Fig. 15 demonstrates the decision-making of Slovene learners of English as they pronounce the word "rubs". While *Fig. 14* shows how the winning candidate is also the "correct" candidate (which is the case with the majority of words discussed in this chapter also when it comes to the pronunciation variants of Slovene learners of English), *Fig. 15* shows the actual winning candi-

date, with by far the highest percentage of utterances (cf. *Table 5*), due to the obvious violation of the constraint *OBSTRUENT (voice). In order to show how b. r ɒps could be the winning candidate, the constraints needed to be reranked. It can be assumed that were there more similar cases in the tasks offered to Slovene learners of English during collecting of materials, more such results would have occurred. This proven true, it might be considered a generalization and part of the system of Slovene learners of English[13].

Fig. 15: Tableau for /r ɒz/, the winning candidate is the actual resulting candidate in the case of Slovene learners of English

Input: /rɒ+z/ "rubs"	CODA OBSTRUENT (voice)	MAX-IO	DEP-IO	IDENT-IO (voice)
a. r ɒz	*!*			
b. r ɒps				*
c. r ɒz ƶ/s	*		*!	
d. r ɒ	*	*!		

3. Conclusions

The deductive approach to the study of the pronunciation of English in Slovenia involved the treatment of materials gathered in fieldwork and the obtained results in the framwork of linguistic theories which lent themselves to show the potential of defining an interlanguage system of the English spoken by Slovene learners (in the framework of the MDH theory) and to highlight desision--making as Slovene learners of English pronounce final consonant clusters of English words (in the framework of Optimality Theory).

Admittedly, only a limited number of examples of two or more member codas were treated in this study, as the latter was not specifically designed to prove a theory but rather observe processes in the Slovene-English interlanguage of Slovene speakers tutored in English. We showed possibilities of defining the rules of Slovene-English Interlanguage, which deviate from the L1 ones as well as the L2 ones. One such rule is the preference for S-F final clusters rath-

[13] It is the key assumption of optimality theory that the resolution to the conflicts among the universal constraints are the grammars. A set of universal constraints ranked in a specific way builds the grammar of a particular language. Thus, the differences between various languages rest in different rankings of a single set of universal constraints. In this regard, 'reranking' of constraints actually constitute the grammars of languages.

er than F-S ones. If we add the fortition of final RP /v/ before a pause[14] and the extreme opening of RP /e/ in Upper Carniola[15], we can say this is a beginning for systematising Slovene English Interlanguage. Also, the obtained results did not vary as much as if less competent, as well as more proficient students, had been included in it (a wider range of various deviations would then occur) since our students were mainly from the top third of their class. There is the developmental issue, however, which using the obtained data appropriately could be seen as we proceed from one age group to another (as was the case with e.g. "buzzed"). Certain partial conclusions could also be made as to how Slovene learners of English react to English final consonant clusters.

Also, this paper shows that a linguistic theory does not necessarily have to rely solely on the system (e.g. OT generating candidates from a pool of potential pronunciation variants defined by the system), but can, if used appropriately, make use of materials reflecting the actual pronunciation of respondents. In the case of the present study it is the pronunciation of English by Sloven learners who in the framework of OT, with their variants of pronouncing individual words or parts of words, i.e. word-final consonant clusters provide the candidates in the tableaux. On the basis of information from both phonological systems, the Slovene one (L1) and the English one (FL), the pronunciation variants actually produced, and on the careful ranking of constraints from both languages in the OT tableaux, we can explain why certain pronunciation choices were made in the English produced by Slovene learners.

[14] See Klementina P. Jurančič, "Voiced labiodental fricative /v/ and some phonotactic statements regarding the English by Slovene learners", in: *Talking English phonetics across frontiers*, ed. Biljana Čubrović and Tatjana Paunović (Newcastle, 2009), pp. 53–72.

[15] See Klementina P. Jurančič, "The 'magnet effect' – a powerful source of L1 dialect interference in the pronunciation of English as a foreign language", in: *The play's the thing: eclectic essays in memory of a scholar and drama translator*, ed. Tomaž Onič and Simon Zupan, ELOPE, No. 11 (Ljubljana, 2014), pp. 45–64.

Klementina P. Jurančič in Bernhard Kettemann

NEKAJ FONOTAKTIČNIH UGOTOVITEV V ZVEZI Z IZGOVORJAVO ANGLEŠKIH SOGLASNIŠKIH SKLOPOV PRI SLOVENSKIH GOVORCIH Z VIDIKA TEORIJE ZAZNAMOVANOSTI MDH IN OPTIMALNOSTNE TEORIJE

POVZETEK

Pričujoči članek opiše vse-slovensko raziskavo izgovorjave angleščine v Sloveniji v tistem delu, kjer so podatki, pridobljeni induktivno, t. j. z zbiranjem gradiva na terenu v vseh sedmih regijah, ki sovpadajo z glavnimi slovenskimi narečnimi skupinami, in analizo teh podatkov, obravnavani na deduktivni način – v okviru teorije zaznamovanosti in Ekmanove različice znotraj le-te (i. e. MDH) in v okviru Optimalnostne teorije (OT), ki je nadgradnja teorije zaznamovanosti. OT se običajno rabi pri razlagi teoretskih problemov v fonetiki in fonologiji. V članku pokažemo, da lahko teorijo enako uspešno apliciramo na izgovorna gradiva pridobljena v praksi, t. j. pri terenskem delu.

Zaznamovanost sklopov je vezana na hipotezo o pojemanju zvočnosti z razdaljo od samoglasnika, namreč da obstaja univerzalna notranja struktura zloga, ki razvršča glasove od samoglasnika navzven v strogo določenem redu: samoglasnik – drsniki – likvidi – nosniki – priporniki – zaporniki. Temu redu pravimo univerzalna kanonična struktura zloga (UCSS). Klub temu je v dvodelnem končnem soglasniškem sklopu zveza pripornik-zapornik običajno nezaznamovana, zvezi zapornik-zapornik (Z-Z) in pripornik-pripornik (P-P) zaznamovani in zveza zapornik-pripornik manj zaznamovana kot Z-Z in P-P. Pravilnost tega se je pokazala v rezultatih izgovorjave besed "lets", "puts", kjer se zdi, da je slovenskim učencem v procesu poenostavljanja znotraj slovensko angleškega medjezika ljubši zaznamovani (Z-P) tip soglasniškega sklopa kot pa nezaznamovani tip (P-Z). Rezultati za besedo "nest" pa zgoraj omenjeno ugotovitev znova zanikajo in slovenske govorce angleščine postavlja ob bok predvidljivosti prevlade zveze Z-P nad zvezo P-Z.

Eckman se dotakne tudi problema t. i. "medjezika". Medjezik je oblika tujega jezika, ki jo govorijo nenaravni govorci tega jezika in ima pravila, ki so neodvisna tako od prvega jezika kot dugega jezika. Eckman meni, "da bi univerzalne posplošitve, ki veljajo za primarne jezika, morale držati tudi za medjezik". Glavno vodilo pa ostaja, da morajo posplošitve medjezika biti neodvisne od prvega jezika in od drugega jezika. Pričujoča raziskava demonstrira potencialno pravilo, ki ustreza tem pogojem, namreč pogostejša raba zaznamovanega (Z-P) končnega soglasniškega sklopa od nezaznamovanega sklopa tipa Z-P. To bi ob še dveh podobnih ugoto-

vljenih pravilih v vse-slovenski raziskavi izgovorjave angleščine v Sloveniji, namreč fortis izgovorjavi končnega angleškega zobno-ustničnega /v/ na Gorenjskem, ki bi moral po analogiji biti izgovorjen dvoustnično (Jurančič, 2009), in pretirano odprti angleški /e/ pri dijakih in študentih prav tako z območja Gorenjske (Jurančič, 2014) lahko predstavljal začetek snovanja pravil slovensko angleškega medjezika.

OT pri končnih soglasniških sklopih ugotavlja zaporedje odločitev v zvezi s posameznimi fonološkimi značilnostmi izgovora besede ali dela besede, ki vplivajo na končni izgovor sklopa, tako pravilnega kot nepravilnega. V pričujočem članku uporabimo podatke, ki smo jih dobili pri analizi na terenu pridobljenega gradiva, ki smo ga nato obdelali z vidika teorije zaznamovanosti. Teorija zaznamovanosti prispeva pomembne podatke, ki jih optimalnostna teorija uporabi za nadaljnjo analizo.

V 90-ih letih prejšnjega stoletja je, namreč, OT, postala vodilni teoretski okvir za analizo fonološkega gradiva v fonologiji ali slovnici določenega jezika. Osrednja ideja, ki jo OT opredeljuje, je, da se dejanske ali 'površinske' oblike besed ali potencialni realni govor razvije prek ocenjevanja tekmujočih in razvrščenih ali rangiranihh omejtev ('constraints').

Omejitve, ki jih rangiramo od leve proti desni v tabelah, imenovanih 'tableaux', se določijo iz seznama fonoloških lastnosti glasov, ki se pojavijo, ko ti tvorijo večje enote (na primer soglasniške sklope) v besedah ali delih besed.

Po tem ko omejitve, kot so izpust ('deletion'), epenteza (vrinjeni glas), sprememba v zvenečnosti ('voice'), sprememba v mestu izgovorjave ('place') itd. rangiramo v tabeli po pomebnosti od leve proti desni, v levi stolpec vnesemo tekmujoče možne oblike izgovorjave obravnavane besede ali dela besede. Slednje nato tekmujejo med seboj tako, da ugotavljamo, kje so omejitve ujemajo s tekmujočo varianto izgovorjave in kje se pravila v omejitvah kršijo. Zmagovalna varianta je tista, ki doživi najmanj kršitev ('violations') ali pa so kršitve majhne. Če so kršitve pogubne ('fatal'), varianta izpade. S postopnim izpadanjem pridemo do zmagovalne variante.

Pri fonologiji prvega jezika (F1) sta tako seznam omejitev kot razporeditev omejitev po pomembnosti dokaj določena. Pri drugem ali tujem jeziku (F2 ali FL) pa nastane težava, ker je potrebno upoštevati omejitve prvega in drugega jezika in jih od primera do primera pravilno razvrščati po pomembnosti.

Pričujoča študija raziskuje angleščino kot drugi ali tuji jezika, kjer lahko OT v teroetičnem smislu predvidi izide obenem pa vključuje dejanske rezultate izgovora končnih soglasniških sklopov pri učencih in dijakih iz območij vseh sedmih slovenskih narečnih skupin. OT tu razloži, zakaj so v nekaterih primerih zmagovalne variante drugačne od t. i. pravilnih angleških variant, ter kje in zakaj se zmagovalne variante pri slovenskih učencih in dijakih pokrivajo s pravilnimi. Imamo, torej, opraviti z izjemnim primerom povezovanja teoretičnega sistema (OT) s praktičnimi rezultati raziskave dejanskega govora.

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Avtor: **JURANČIČ Klementina P.**
Dr., docentka
Univerza v Mariboru, Filozofska fakulteta, Oddelek za angleške in ameriške študije
Koroška cesta 160, SI–2000 Maribor, Slovenija
Soavtor: **KETTEMANN Bernhard**
Dr., redni profesor
Karl-Franzens-Universität Graz, Institut für Anglistik und Amerikanistik / Univerza Karla in Franza v Gradcu, Inštitut za anglistiko in amerikanistiko
Heinrichstrasse 36, A–8010 Graz, Austrija

Naslov: **NEKAJ FONOTAKTIČNIH UGOTOVITEV V ZVEZI Z IZGOVORJAVO ANGLEŠKIH SOGLASNIŠKIH SKLOPOV PRI SLOVENSKIH GOVORCIH Z VIDIKA TEORIJE ZAZNAMOVANOSTI MDH IN OPTIMALNOSTNE TEORIJE**

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Jezik: angleški (izvleček angleški in slovenski, povzetek slovenski)

Ključne besede: soglasniški sklopi, angleščina, teorija zaznamovanosti (MDH), Optimalnostna teorija (OT)

Izvleček: Pričujoči prispevek obravnava angleške soglasniške sklope, ki jih izgovarjajo slovenski učenci in dijaki, z vidika dveh pristopov. Prvi je teorija zaznamovanosti MDH, ki jo je na angleških govorcih preizkušal Eckman (1977). Na osnovi tipoloških univerzalij kot je implicitnostni odnos, teorija zagovarja, da če se beseda začne na dva zapornika ali konča na dva zapornika (ali dva pripornika), to pomeni, da v jeziku obstaja samo en sklop v sestavi zapornik in pripornik. Drugi obravnavani pristop v tem prispevku je Optimalnostna teorija (Prince in Smolensky, 1993). Teorija uporabi inherentni konflikt, ki ga omejitve in kršitve teh omejitev povzročijo seriji variant soglasniških sklopov in njihovim fonološkim lastnostim. Skozi reševanje nastalega konflikta pridemo do optimalnega kandidata določene slovnice.